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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,194	06/20/2000	Alexander Mostov	TI-29732	6007

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EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/597,194	MOSTOV ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-9,12-17 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9,14-17 and 19-22* is/are allowed.

6)☒ Claim(s) *7,8,12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *6/20/2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7, 8, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong (previously cited in Office Action 5/19/2004) in view of Kim (U. S. Patent No. 6, 035, 008) and in further view of Toda et al. (U. S. Patent No. 6, 343, 221).

Regarding claim 7, Ong discloses a communications receiver comprising:

an LNA (Fig. 1, block 112, wherein the RF amplifier is a low noise amplifier) for amplifying a received signal to generate an LNA output signal, the LNA having M gain setting modes of operation (column 2, lines 59-64), the gain of the LNA determined in response to an LNA gain control command (column 2, lines 55-59);

a mixer (Fig. 1, block 114) for multiplying the LNA output signal so as to generate a mixer output signal, the mixer having N gain setting modes of operation (Fig. 4, column 3, line 65-column 4, line 13), the gain of the mixer determined in response to a mixer gain control command signal (column 2, lines 55-59);

a detector (Fig. 1, block 140) for recovering from the mixer output signal, information originally transmitted;

a controller (Fig. 1, block 106, column 2, line 55-column 4, line 19) to generate the gain control command to the LNA and the mixer gain control command to the mixer, the controller adapted to set the setting of the LNA and of the mixer to one of a plurality of gain states wherein each gain state consists of a unique combination of LNA gain settings and mixer gain settings (Fig. 4, column 3, line 65-column 4, line 13).

Ong does not disclose the mixer multiplies the LNA output signal with a local oscillator signal and a band pass filter located before the mixer and after the LNA and adapted to filter the LNA output signal before input to the mixer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that multiplying a received signal by an oscillating signal is an operation which is used simply convert the received signal to a desired frequency. Thus, if the signal is already received at a desired frequency, there is no need to implement a local oscillator. Thus, converting the signal to a desired frequency is deemed a design choice and does not constitute patentability.

Toda et al. discloses a band pass filter located before a mixer and after the LNA and adapted to filter the LNA output signal before input to the mixer in a communications receiver (Fig. 2, blocks 601, 603, and 605, column 3, lines 8-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include to modify the receiver of Ong with the teachings of Toda et al. in order allow the removal of spurious signals which can cause intermodulation products and ultimately result in a loss of information (see Ciccarelli et al., U. S. Patent No. 6, 175, 279, column 3, line 56-column 4, line14).

Regarding claim 8, Ong discloses a communications receiver comprising:

an LNA (Fig. 1, block 112, wherein the RF amplifier is a low noise amplifier) for amplifying a received signal to generate an LNA output signal, the LNA having M gain setting modes of operation (column 2, lines 59-64), the gain of the LNA determined in response to an LNA gain control command (column 2, lines 55-59);

a mixer (Fig. 1, block 114) for multiplying the LNA output signal so as to generate a mixer output signal, the mixer having N gain setting modes of operation (Fig. 4, column 3, line 65-column 4, line 13), the gain of the mixer determined in response to a mixer gain control command signal (column 2, lines 55-59);

a detector (Fig. 1, block 140) for recovering from the mixer output signal, information originally transmitted;

a controller (Fig. 1, block 106, column 2, line 55-column 4, line 19) to generate the gain control command to the LNA and the mixer gain control command to the mixer, the controller adapted to set the setting of the LNA and of the mixer to one of a plurality of gain states wherein each gain state consists of a unique combination of LNA gain settings and mixer gain settings (Fig. 4, column 3, line 65-column 4, line 13).

Ong does not disclose the mixer multiplies the LNA output signal with a local oscillator signal and a first band pass filter at the input of the LNA and a second band pass filter having a narrow bandwidth relative to the first band pass filter located after the mixer to filter the mixer output. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that multiplying a received signal by an oscillating signal is an operation which is used simply convert the received signal to a desired frequency. Thus, if the signal is already received at a desired frequency, there is no need to implement a local oscillator. Thus,

converting the signal to a desired frequency is deemed a design choice and does not constitute patentability.

Toda et al. discloses a first band pass filter at the input of the LNA and a second band pass filter having a narrow bandwidth relative to the first band pass filter located after the mixer to filter the mixer output in a communications receiver (Fig. 3, blocks 601, 603, and 605, column 3, lines 5-36, wherein the signal entering the second filter is at a lower frequency (130 MHZ), thus the second filter has a narrow bandwidth relative to the first filter). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include to modify the receiver of Ong with the teachings of Toda et al. in order allow the removal of spurious signals which can cause intermodulation products and ultimately result in a loss of information (see Ciccarelli et al., U. S. Patent No. 6, 175, 279, column 3, line 56-column 4, line14).

Regarding claim 13, Ong discloses a communications receiver comprising:

an LNA (Fig. 1, block 112, wherein the RF amplifier is a low noise amplifier) for amplifying a received signal to generate an LNA output signal, the LNA having M gain setting modes of operation (column 2, lines 59-64), the gain of the LNA determined in response to an LNA gain control command (column 2, lines 55-59);

a mixer (Fig. 1, block 114) for multiplying the LNA output signal so as to generate a mixer output signal, the mixer having N gain setting modes of operation (Fig. 4, column 3, line 65-column 4, line 13), the gain of the mixer determined in response to a mixer gain control command signal (column 2, lines 55-59);

a detector (Fig. 1, block 140) for recovering from the mixer output signal, information originally transmitted;

a controller (Fig. 1, block 106, column 2, line 55-column 4, line 19) to generate the gain control command to the LNA and the mixer gain control command to the mixer, the controller adapted to set the setting of the LNA and of the mixer to one of a plurality of gain states wherein each gain state consists of a unique combination of LNA gain settings and mixer gain settings (Fig. 4, column 3, line 65-column 4, line 13).

Ong does not disclose the mixer multiplies the LNA output signal with a local oscillator signal and a band pass filter located before the mixer to filter the LNA output signal before input to the mixer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that multiplying a received signal by an oscillating signal is an operation which is used simply convert the received signal to a desired frequency. Thus, if the signal is already received at a desired frequency, there is no need to implement a local oscillator. Thus, converting the signal to a desired frequency is deemed a design choice and does not constitute patentability.

Toda et al. discloses a band pass filter located before a mixer to filter the LNA output signal before input to the mixer in a communications receiver (Fig. 2, blocks 601, 603, and 605, column 3, lines 8-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include to modify the receiver of Ong with the teachings of Toda et al. in order allow the removal of spurious signals which can cause intermodulation products and ultimately result in a loss of information (see Ciccarelli et al., U. S. Patent No. 6, 175, 279, column 3, line 56-column 4, line14).

Regarding claim 13, Ong discloses a communications receiver comprising:

an LNA (Fig. 1, block 112, wherein the RF amplifier is a low noise amplifier) for amplifying a received signal so as to generate an LNA output signal, the LNA having a low gain and high gain mode of operation (column 2, lines 59-64 and Fig. 4, column 3, line 65-column 4, line 13), the gain of the LNA determined in response to an LNA gain control command (column 2, lines 55-59);

a mixer (Fig. 1, block 114) for multiplying the LNA output signal so as to generate a mixer output signal, the mixer having a low gain and high gain mode of operation (Fig. 4, column 3, line 65-column 4, line 13), the gain of the mixer determined in response to a mixer gain control command signal (column 2, lines 55-59);

a detector (Fig. 1, block 140) for recovering from the mixer output signal, information originally transmitted;

a controller (Fig. 1, block 106, column 2, line 55-column 4, line 19) to generate the gain control command to the LNA and the mixer gain control command to the mixer, the controller adapted to set the setting of the LNA and of the mixer to one of a four gain states (Fig. 4) wherein each gain state consists of a unique combination of LNA gain settings and mixer gain settings (Fig. 4, column 3, line 65-column 4, line 13).

Ong does not disclose the mixer multiplies the LNA output signal with a local oscillator signal and a first band pass filter at the input of the LNA and a second band pass filter having a narrow bandwidth relative to the first band pass filter located after the mixer to filter the mixer output. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that multiplying a received signal by an oscillating signal is an operation

which is used simply convert the received signal to a desired frequency. Thus, if the signal is already received at a desired frequency, there is no need to implement a local oscillator. Thus, converting the signal to a desired frequency is deemed a design choice and does not constitute patentability.

Toda et al. discloses a first band pass filter at the input of the LNA and a second band pass filter having a narrow bandwidth relative to the first band pass filter located after the mixer to filter the mixer output in a communications receiver (Fig. 3, blocks 601, 603, and 605, column 3, lines 5-36, wherein the signal entering the second filter is at a lower frequency (130 MHZ), thus the second filter has a narrow bandwidth relative to the first filter). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include to modify the receiver of Ong with the teachings of Toda et al. in order allow the removal of spurious signals which can cause intermodulation products and ultimately result in a loss of information (see Ciccarelli et al., U. S. Patent No. 6, 175, 279, column 3, line 56-column 4, line14).

Allowable Subject Matter

3. Claims 9, 14, and 15 are allowable over prior art because related references do not disclose setting the LNA and mixer to different gain modes using a controller, including a detector which comprises of a limiter, discriminator, and data slicer. Claims 16, 17, and 19-22 are allowable over prior art because prior art references do not disclose setting the LNA and mixer to different gain modes to improve linearity while reducing sensitivity and a controller

which switches to a state having a lower sensitivity in response to a low correlation; a controller which switches the receiver back to a previous state if the error rate obtained in a new state is worse than the error rate in a previous state; and a controller which sets the receiver to a low gain state in response to a high RSSI reading and a high error rate.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim (U. S. Patent No. 6, 035, 008) discloses a receiver containing a low noise amplifier and mixer and band pass filters located before the amplifier, between the amplifier and the mixer, and after the mixer.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
February 15, 2005

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